CITA 430 Computer Integration and Interoperability
Professor Klingaman
Network and Systems Development Term Project
August 24, 2011 – December 9, 2011

Objective: Evaluate, research, and develop solutions for interoperability issues, and demonstrate competencies through applied research and practical application. Successful completion of this project requires a complete needs assessment and plan for the integration of enterprise level networked systems to support business applications. Grading will be based on a 100 point total.

Timeline: This project begins on Wednesday August 24, 2011 and must be completed no later than Friday December 9, 2011. Please note that each part has a specific due date.

Scenario: Your team has been hired by Galt & Associates, a New York City engineering firm who has recently purchased a competitor in Hamilton, to design and construct an integrated enterprise network infrastructure. You need to construct an operational network by incorporating the following functional components to meet Galt's specific needs:

Part One: Logical and Physical Diagrams (12 points)

Create the following diagrams, and aggregate them into a single PDF document. These diagrams must incorporate the components from all parts of the project. Physical diagrams must include IP addresses, device names, and physical port numbers. Logical diagrams must include the location of specific services.
Diagram #1: Logical LAN, Hamilton Site: Microsoft Environment
Diagram #2: Physical LAN, Hamilton Site: Microsoft Environment
Diagram #3: Logical LAN New York City Site: Open Source Environment
Diagram #4: Physical LAN New York City Site: Open Source Environment
Diagram #5: Logical WAN connect Hamilton Site to New York City Site
Diagram #6: Physical WAN connect Hamilton Site to New York City Site

Part Two: Network Services (18 points)

Construct the following operational services on the Hamilton site (need to be proprietary solutions). A minimum of three of these servers must be virtualized: Web server, File server, Email server, Print server, Active Directory, DHCP server, DNS server, RAS server, WSUS server, and Blackberry server.

Construct the following operational services on the New York City site (need to be open-source solutions). A minimum of three of these servers must be virtualized: Web server, File server, Email server, Print server, LDAP server, DHCP server, DNS server, and SMS server.

Part Three: Routing and Switching (10 points)

Provide connectivity between all servers and clients at both the Hamilton and NYC sites.
Create inter-VLAN routing to move data between Guest, Sales, Administration, and Engineering VLANs at the Hamilton site.
Construct connectivity between Hamilton and NYC using an emulated DS-1.
Construct backup connectivity between Hamilton and NYC using a site-to-site IPSec VPN.

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Part Four: Network Management (15 points)

Deploy a logon script to map a user's network drives and set a default printer.
Distribute software using Active Directory group policy.
Configure automatic update for clients using WSUS.
Perform LAN/WAN traffic monitoring and analysis, and measure utilization.
Automate scheduled data backups using *Backup Exec* to network attached storage.
Deploy VoIP to enable voice communication across WAN.
Integrate Hamilton AD with NYC LDAP using *Likewise*
Migrate Microsoft Exchange email service from Part Two to a hosted cloud computing solution.

Part Five: Network Security (15 points)

Integrate 802.1x with Hamilton site's Active Directory to authenticate both wired and wireless clients into correct VLAN.

Implement "captive portal" for guest access by deploying MS Network Access Protection (NAP) to remediate non-authenticated clients by automatically assigning guest VLAN with Internet only, with no access to internal network resources.

Deploy MS Network Access Protection (NAP) to perform automatic anti-virus check.

Place a hardened Web server into a DMZ as a bastion host.

Implement an Intrusion Detection System (IDS).

Part Six: Integration and Interoperability (20 points)

All network project components must be running concurrently, and conform to your Part One diagrams. Submit all supporting documentation for this part of the project, as well as one-page self-reflection on your lessons learned.

Part Seven: Documentation (10 points)

Aggregate documentation for all your project work, and submit electronically via Blackboard.

Additional Requirements

- Grading of simultaneous operation of Part Five will be done by appointment starting the week of December 1st.
- All software used for the purposes of this project must be legally licensed. Using illegal software may result in an automatic failing grade for all team members!
- DO NOT PURCHASE any software or hardware for this project.
- Individual grades for this project may be adjusted by the professor to reflect individual performance.
- Please communicate *any* concerns regarding this project to the professor immediately.